IN THE CLAIMS

1. (Currently amended) A method for detecting position changes of a medical implant in a patient, comprising the steps of:

disposing a plurality of x-ray detectable markers in an anatomical environment of an implanted medical implant, said markers being spatially separated from said medical implant and said medical implant having x-ray detectable points thereon different from said markers;

obtaining one first 2D x-ray exposure, from a first projection direction, of a region of the patient containing said implant and said anatomical environment at a first point in time, in which a first distribution of said markers and said points is detectable;

obtaining one second 2D x-ray exposure, from a second projection direction different from said first projection direction, of said region at a second point in time, in which a second distribution of said markers and said points is detectable, said second point in time being temporally separated from said first point in time such that a positional change of said implant in said environment may have occurred;

electronically detecting said first and second distributions respectively in said first and second 2D x-ray exposures; and

<u>in a processor,</u> automatically calculating from said first and second distributions, with no 3D reconstruction of spatial positions of said markers and points, a degree of probability that said first and second distribution represent projections of the same three-dimensional distribution of said markers and said points and, from said degree of

probability, determining whether a positional change of said implant in said environment has occurred and, from said processor, emitting an indication that identifies only whether said positional change has occurred or not occurred.

2. (Currently amended) A method as claimed in claim 1 wherein the step of determining whether said positional change of the implant has occurred comprises defining a degree of probability threshold, and automatically electronically generating ~~an~~ said indication that a positional change of said implant has occurred if said degree of probability does not exceed said threshold.

3. (Original) A method as claimed in claim 1 comprising detecting said first and second distributions by digital image processing of the respective first and second 2D x-ray exposures.

4. (Original) A method as claimed in claim 1 comprising:

at said first point in time, also obtaining a first calibrated 2D x-ray exposure of said region;

from said first 2D x-ray exposure and said first calibrated 2D x-ray exposure, calculating a first 3D distribution of said markers and points for said first point in time;

at said second point in time, obtaining a second calibrated 2D x-ray exposure of said region;

from said second 2D x-ray exposure and said second calibrated 2D x-ray exposure, calculating a second 3D distribution of said markers and said points for said second point in time; and

comparing said first 3D distribution and said second 3D distribution and, from said comparison, calculating a magnitude of said positional change of said implant, if said position change has occurred.

5. (Original) A method as claimed in claim 1 wherein said implant is a prosthesis, and wherein the step of disposing a plurality of x-ray detectable markers in an anatomical environment of said implant comprises disposing a plurality of metal spheres in at least one bone bordering said prosthesis.

6. (Original) A method as claimed in claim 1 comprising designating said points of said implant by introducing x-ray detectable markers into said implant.

7. (Currently Amended) An x-ray system comprising:

a medical implant having x-ray detectable points thereon, said medical implant being configured for implantation in a patient;

a plurality of x-ray detectable markers configured to be disposed in an anatomical environment of the implanted medical implant, said markers being spatially separated from said medical implant and said markers being different from said x-ray detectable points;

an x-ray image acquisition apparatus that obtains a first 2D x-ray exposure, from a first projection direction, of a region of the patient containing said implant and said anatomical environment, in which a first distribution of said markers and said points is detectable at a first point in time, and that obtains a second 2D x-ray exposure, from a second 2D x-ray exposure, from a second projection direction different from said first projection direction, of said region at a second point in time, in which a second distribution of said markers and said points is

detectable, said second point in time being temporally separated from said first point in time such that a positional change of said implant in said environment may have occurred;

a device that electronically detects said first and second distributions respectively in said first and second 2D x-ray exposures; ~~and~~

a computer that calculates from said first and second distributions, with no 3D reconstruction of spatial positions of said markers and points, a degree of probability that said first and second distribution represent projections of the same three-dimensional distribution of said markers and said points and that determines, from said degree of probability, whether a positional change of said implant in said environment has occurred; and

an output device connected to said computer, said computer being configured to emit a notification, via said output device that identifies only whether said positional change has occurred or not occurred.

8 (Currently amended) An x-ray system as claimed in claim 7 wherein said computer determines whether said positional change of the implant has occurred by defining a degree of probability threshold, and automatically electronically generates ~~an~~ said indication that a positional change of said implant has occurred if said degree of probability does not exceed said threshold.

9. (Original) An x-ray system as claimed in claim 7 wherein said detection device is a digital image processor.

10. (Original) An x-ray system as claimed in claim 7 wherein said x-ray image acquisition apparatus at said first point in time, also obtains a first calibrated 2D x-ray exposure of said region, and wherein said computer, from said first 2D x-ray exposure and said first calibrated 2D x-ray exposure, calculates a first 3D distribution of said markers and points for said first point in time, and wherein said x-ray image acquisition apparatus, at said second point in time, obtains a second calibrated 2D x-ray exposure of said region, and wherein said computer, from said second 2D x-ray exposure and said second calibrated 2D x-ray exposure, calculates a second 3D distribution of said markers and said points for said second point in time, and compares said first 3D distribution and said second 3D distribution and, from said comparison, calculates a magnitude of said positional change of said implant, if said position change has occurred.

11. (Previously presented) An x-ray system as claimed in claim 7 wherein said implant is a prosthesis, and wherein said plurality of x-ray detectable markers comprises a plurality of metal spheres adapted for placement in at least one bone bordering said implant.

12. (Previously presented) An x-ray system as claimed in claim 7 wherein said x-ray detectable points of said implant are x-ray detectable markers introduced into said implant.